WHAT IS CLAIMED IS:

1. A waveguide grating device, comprising:

at least one waveguide having an end, the end having an endface; and

a waveguide grating fabricated on the endface of the at least one waveguide, the waveguide grating having at least one waveguide layer and at least one grating layer;

wherein the at least one waveguide layer and the at least one grating layer may comprise the same layer.

2. The device of claim 1, wherein the at least one waveguide is a fiber.

3. The device of claim 1, wherein the at least one waveguide is rectangular in shape.

4. The device of claim 1, wherein the at least one grating layer comprises a dielectric material.

5. The device of claim 1, wherein the at least one grating layer comprises a polymer.

6. The device of claim 1, wherein the at least one waveguide layer comprises a dielectric material.

7. The device of claim 1, wherein the at least one waveguide layer comprises a polymer.

8. The device of claim 1, wherein the at least one grating layer and the at least one waveguide layer comprise the same layer.

9. The device of claim 1, wherein the at least one grating layer and the at least one waveguide layer comprise different layers in contact with each other.

10. The device of claim 9, wherein the waveguide grating further comprises at least a third layer in contact with the at least one waveguide layer, the at least one grating layer, or both the at least one waveguide layer and the at least one grating layer.

11. The device of claim 10, wherein the at least third layer comprises a dielectric.

12. The device of claim 10, wherein the at least third layer comprises a metal.

13. The device of claim 12, further comprising at least a fourth organic layer in contact with the at least third layer.

14. The device of claim 9, wherein the waveguide grating further comprises a third layer in contact with the at least one grating layer.

15. A system for spectral filtering, the system utilizing a guided-mode resonance effect in a waveguide, comprising:

a waveguide grating device, comprising:

at least one waveguide having a proximal end and a distal end having an endface; and

a waveguide grating fabricated on the endface of the at least one waveguide, the waveguide grating having at least one waveguide layer and at least one grating layer, the waveguide grating also having a plurality of variable parameters including at least one permittivity of the at least one grating layer, permittivity of the at least one waveguide layer, periodic structure of the at least one grating layer, grating fill factor of the at least one grating layer, thickness of the at least one waveguide layer, and thickness of the at least one grating layer;

wherein the at least one waveguide layer and the at least one grating layer may comprise the same layer, and wherein the permittivity of the at least one waveguide layer and one of the permittivities of the at

least one permittivity of the at least one grating layer may be the same.

16. The system of claim 15, further comprising:

a source coupled to the proximal end of the at least one waveguide for propagating a signal therethrough;

wherein after the signal is propagated, it contacts the waveguide grating and is reflected from the waveguide grating in whole or in part, or transmitted through the waveguide grating in whole in or in part, depending at least partially upon the plurality of variable parameters.

17. The system of claim 16, wherein the source is a laser.

18. The system of claim 16, wherein the source is a continuous wave source.

19. The system of claim 15, further comprising a photodetector operationally coupled to the at least one waveguide.

20. The system of claim 19, wherein the photodetector comprises silicon.

21. The system of claim 19, wherein the photodetector comprises the human eye.

22. The system of claim 15, wherein the at least one waveguide is a fiber.

23. The system of claim 15, wherein the at least one waveguide is rectangular in shape.

24. The system of claim 15, wherein the at least one grating layer comprises a dielectric material.

25. The system of claim 15, wherein the at least one grating layer comprises a polymer.

26. The system of claim 15, wherein the at least one waveguide layer comprises a dielectric material.

27. The system of claim 15, wherein the at least one waveguide layer comprises a polymer.

28. The system of claim 15, wherein the at least one grating layer and the at least one waveguide layer comprise the same layer.

29. The system of claim 15, wherein the at least one grating layer and the at least one waveguide layer comprise different layers in contact with each other.

30. The system of claim 29, wherein the waveguide grating further comprises a third layer in contact with the at least one waveguide layer.

31. The system of claim 29, wherein the waveguide grating further comprises a third layer in contact with the at least one grating layer.

32. The system of claim 15, further comprising at least one sensor operationally coupled to the waveguide grating device.

33. The system of claim 32, wherein the at least one sensor comprises an electrochemical sensor.

34. The system of claim 32, wherein the at least one sensor comprises an optical sensor.

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35. A waveguide grating device, comprising:

at least one waveguide through which a signal having at least one wavelength may be propagated, the at least one waveguide having an end, the end having an endface; and

a waveguide grating fabricated on the endface of the at least one waveguide, the waveguide grating having at least one waveguide layer and at least one grating layer, the waveguide grating also having a plurality of variable parameters including at least one permittivity of the at least one grating layer, permittivity of the at least one waveguide layer, periodic structure of the at least one grating layer, grating fill factor of the at least one grating layer, thickness of the at least one waveguide layer, and thickness of the at least one grating layer, the periodic structure of the at least one grating layer having a period less than the at least one wavelength of the signal;

wherein the at least one waveguide layer and the at least one grating layer may comprise the same layer, and wherein the permittivity of the at least one waveguide layer and one of the permittivities of the at least one permittivity of the at least one grating layer may be the same.

36. A waveguide grating device, comprising:

at least a first waveguide having a first end, the first end having a first endface; and

a first waveguide grating fabricated on the first endface, the first waveguide grating having at least a first waveguide layer and at least a first grating layer;

wherein the at least first waveguide layer and the at least first grating layer may comprise the same layer; and

at least a second waveguide having a second end, the second end having a second endface; and

a second waveguide grating fabricated on the second endface, the second waveguide grating having at least a second waveguide layer and at least a second grating layer;

wherein the at least second waveguide layer and the at least second grating layer may comprise the same layer.

37. The system of claim 36, wherein the at least first and second waveguides are fibers.

38. A method of forming a waveguide grating device, comprising:
providing at least one waveguide having an end, the end having an endface;
fabricating a waveguide grating on the endface of the waveguide to form the waveguide grating device.

39. The method of claim 38, further comprising cleaving the end to form the endface of the at least one waveguide.

40. The method of claim 38, wherein the waveguide grating comprises at least one layer of polymer.

41. The method of claim 40, wherein the fabricating comprises dipping the endface of the at least one waveguide into a polymer.

42. The method of claim 41, further comprising patterning the at least one layer of polymer.

43. The method of claim 42, wherein the patterning comprises holographic interferometry.

44. The method of claim 42, wherein the patterning comprises photolithography.

45. The method of claim 40, wherein the fabricating comprises spin coating the endface of the at least one waveguide with a polymer.

46. The method of claim 38, wherein the waveguide grating comprises at least one layer of dielectric.

47. The method of claim 46, further comprising etching the at least one layer of dielectric to form a grating.

48. The method of claim 38, wherein the waveguide grating comprises at least a first layer and at least a second layer adjacent the at least first layer, and wherein the fabricating comprises depositing the at least first layer on the endface of the at least one waveguide by sputtering and coating the at least first layer with the at least second layer.

49. The method of claim 38, wherein the waveguide grating comprises at least a first layer, and wherein the fabricating comprises depositing the at least first layer on the endface of the at least one waveguide by thermal evaporation.

50. The method of claim 38, wherein the waveguide grating comprises at least a first layer, and wherein the fabricating comprises depositing the at least first layer on the endface of the at least one waveguide by electron-beam evaporation.

51. The method of claim 38, wherein the waveguide grating comprises at least a first layer, and wherein the fabricating comprises depositing the at least first layer on the endface of the at least one waveguide by liquid phase epitaxy.

52. A method of detecting at least one parameter of a medium, comprising:

providing a waveguide grating device, comprising:

at least one waveguide having an end, the end having an endface; and

a waveguide grating fabricated on the endface of the at least one waveguide, the waveguide grating having at least one waveguide layer and at least one grating layer;

wherein the at least one waveguide layer and the at least one grating layer may comprise the same layer;

contacting the waveguide grating with a medium;

propagating a signal having at least one signal attribute through the at least one waveguide such that the signal contacts the waveguide grating and the at least one signal attribute is modified; and

comparing the modified signal attribute to a known signal attribute to detect the at least one parameter of the medium.

53. The method of claim 52, wherein the at least one signal attribute comprises the spectral content of the signal.

54. The method of claim 52, wherein the at least one signal attribute comprises the intensity of the signal.

55. The method of claim 52, wherein the at least one parameter of the medium comprises the presence or absence of a substance.

56. The method of claim 52, wherein the at least one parameter of the medium comprises the quantity of a substance.

57. The method of claim 52, wherein the at least one parameter of the medium comprises the refractive index of the medium.

58. The method of claim 52, wherein the at least one parameter of the medium comprises the thickness of the medium.

59. The method of claim 52, wherein the medium includes a first parameter and a second parameter, and the comparing comprises comparing the modified signal attribute to a known signal attribute to detect both the first and second parameters.

60. The method of claim 52, wherein the at least one signal attribute comprises the polarization of the signal.

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